



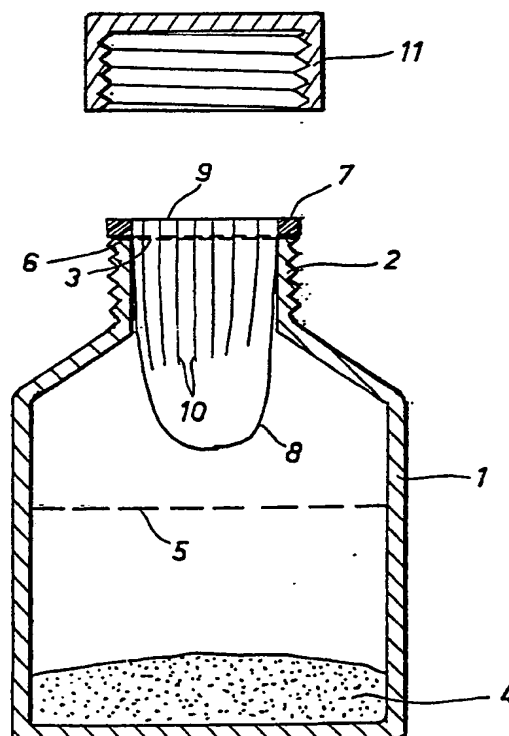
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: A PROCESS OF MIXING A FLUID WITH A PULVERIZED SUBSTANCE AND A CONTAINER FOR CARRYING OUT THE PROCESS

(57) Abstract

The invention relates to a process of mixing a fluid with a pulverized substance which has tendency to emit dust when touched. The invention also relates to a container (1) for carrying out the process. According to the process the substance (4) is introduced into the container (1), whereafter the opening (3) of the container is covered by a filter (8). Then the fluid is introduced into the container through the filter (8). The filter (8), which is capable of permitting passage of the fluid but not the dust, has a vault extending into the opening (3) and consists suitably of a web of hairy or woolly threads (12, 13). The web (8) is suitably in the form of a bag, which extends a portion into the opening (3) of the container.



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A process of mixing a fluid with a pulverized substance
and a container for carrying out the process

TECNICAL FIELD

5

The present invention relates to a process of mixing a fluid with a pulverized substance which has tendency to emit dust or powder when touched. The invention also relates to a container for carrying out the process.

10

PRIOR ART

Persons who carry out such mixing processes are often afflicted by dust that whirls up in the air when the fluid reaches the pulverized substance. A particular serious problem is the manual preparing of medical mixtures, both solutions and suspensions, for example water mixtures of antibiotic. Such mixtures, which are given to children because they have difficulty in swallowing tablets, have a durability of only two weeks, for which reason they cannot be prepared at the medical factory but have to be prepared at the drug-store each time. Therefore, the drug-store attendants are often susceptible to allergical problems due to the dust that whirls about in the air when the water is poured on the pulverized substance during the preparing of the mixture.

DISCLOSURE OF THE INVENTION

30 An object of the invention is, therefore, to provide a process and a container of the aforementioned kind, where no dust will whirl up towards the attendants. This object is achieved with a process and a container of the aforesaid kind having the characterizing features set forth in
35 claims 1 and 3.

Further developments of the invention will be apparent

from the depending claims.

BRIEF DESCRIPTION OF THE DRAWINGS

5 The invention will be described in more detail below with reference to the accompanying drawing, which illustrates a preferred embodiment of the invention.

10 Fig. 1 shows a longitudinal section of a container according to the invention. Fig. 2 shows a portion on an enlarged scale of a filter web which can be used in a filter in the container in accordance with Fig. 1.

15 PREFERRED EMBODIMENT

Fig. 1 shows an exemplifying container, namely a medical container in the form of a cylindrical glass bottle 1 having an externally screw-threaded cylindric neck 2, the circular opening 3 of which defines the only opening of the bottle 1. The container 1 is partially filled with a predetermined amount of a pulverized medical substance 4, for instance antibiotic in the form of penicillin, for instance. The container 1 is also intended to be partially filled with a predetermined amount of fluid, for example water, that is to be mixed with the medical substance 4, for instance up to a level 5.

Supported on the circular end edge 6 of the neck opening 3 is a holder ring 7, for example of a plastic, at which a filter 8 in the form a web or the like is secured, for example by means of a press-joint, along a free edge 9. The web 8 covers the opening 3 and forms a vault into the same, preferably in the form of a bag which extends at least a portion into the neck 2, or, as is shown in Fig.1, also a portion into the container 1. The bag 8 is provided with longitudinal pleats or gatherings 10, which in-

crease the filter surface.

A closure device in the form of an internally threaded cap 11 is designed to be threaded over the neck 2 thereby
5 to also press the holder ring 7 like a sealing against the end edge 6 of the neck 2.

The material of the filter 8 consists suitably of a web of a fine net of threads or cords 12 and 13, see fig. 2, for
10 instance textile threads of a nature material such as cotton or a synthetic material or a combination thereof. According to the embodiment shown in Fig. 2, the threads 12, 13 are hairy or woolly such that they form a gutter which is impermeable to dust, and which also contributes
15 to the generation of a fluid film on the web 8 which prevents any passage of dust therethrough. The web is suitably made of a textile web of gauze bandage type.

The process according to the invention for mixing a fluid
20 and a pulverized medical substance is carried out as follows.

A predetermined amount of the pulverized substance 4 is,
25 preferably in a factory, caused to partially fill the container 1. The opening 3 of the container is then covered by the filter 8, which is thereby brought into its active position, whereafter the cap 11 is screw-tightened. The container 1 together with the predetermined amount
30 4 can now be transported to the drug-store where it is stored while waiting for any demand for a preparation of a mixture. When such a demand is present, the drug-store attendant unscrews the cap 11, whereupon the predetermined amount of fluid is introduced into the container 1 through the filter 8. Then the filter 8 is removed, i.e. it is brought to its inactive position, and the
35 cap 11 is screw-tightened. The container 1 is shaken so

that the substance 4 and the fluid is carefully mixed.
The mixture is now ready to be delivered to the patient.

The filter 8 may alternatively remain in the container
5 while shaking the same.

When preparing mixtures which require a significant little
amount of fluid it may occur that too high percentage of
the fluid will be absorbed by the filter 8. This is read-
10 ily compensated for by the introduction of correspondingly
larger amount of fluid, suitably according to a fluid-com-
pensation table.

C l a i m s

1. A process of mixing a fluid with a pulverized substance which has tendency to emit dust when touched,
5 c h a r a c t e r i z e d i n
a) causing the pulverized substance to partially fill a container having an opening,
b) covering the opening by a filter which is capable of permitting passage of said fluid but not said dust, and
10 c) introducing the fluid into the container through the filter and shaking the container so that the pulverized substance mixes with the fluid.
2. A process according to claim 1, c h a r a c t e -
15 r i z e d i n t h a t t h e p u l v e r i z e d s u b s t a n c e i s a m e d i c a l s u b s t a n c e .
3. A container for carrying out the process according to claim 1, c h a r a c t e r i z e d i n t h a t t h e c o n t a i n e r
20 (1) is only partially filled with said pulverized substance (4) in order to permit introduction of said fluid, the container having an opening (3) which is provided with a filter (8) which is capable of permitting passage of said fluid but not said dust, and the container being provided
25 with a closure device (11) capable of closing the opening.
4. A container according to claim 3, c h a r a c t e -
r i z e d i n t h a t t h e f i l t e r (8) f o r m s a v a u l t i n t o t h e o p e n i n g (3) t o f o r m a b a g , w h i c h e x t e n d s a p o r t i o n i n t o
30 t h e c o n t a i n e r (1).
5. A container according to claim 4, c h a r a c t e -
r i z e d i n t h a t t h e b a g (8) i s p l e a t e d t o f o r m a n i n - c r e a s e d f i l t e r s u r f a c e .
- 35 6. A container according to any of the claims 3 - 5, c h a r a c t e r i z e d i n t h a t t h e f i l t e r (8) c o n s i s t s

of a fine net of threads (12, 13).

7. A container according to claim 6, c h a r a c t e -
r i z e d in that the threads (12, 13) have certain
5 hairiness and woolliness which obstructs said passage of
dust.

8. A container according to any of the claims 3 - 7,
c h a r a c t e r i z e d in that the filter (8) is
10 attached to a holder ring (7) which like a sealing is
loosely attachable over the opening (3).

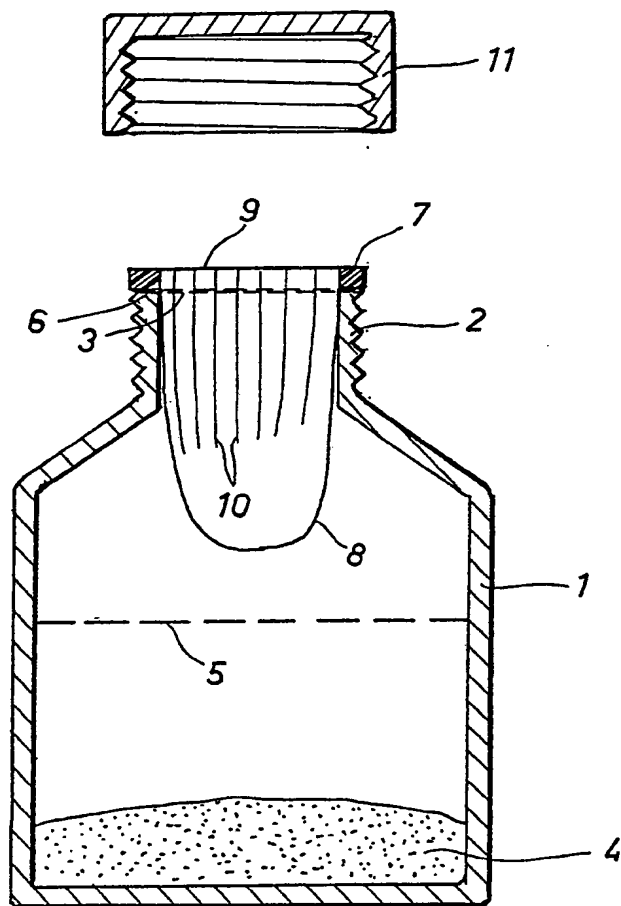


FIG. 1

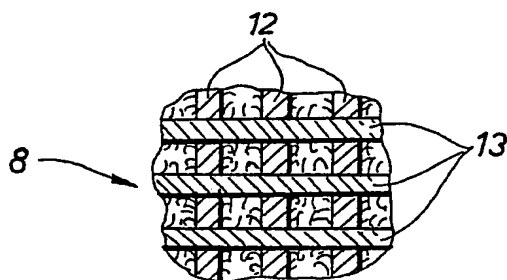


FIG. 2

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INTERNATIONAL SEARCH REPORT

International Application No PCT/SE 89/00023

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC ⁴ <div style="text-align: center; font-family: monospace; font-size: 1.2em;">A 61 J 1/00, B 01 F 3/12</div>										
II. FIELDS SEARCHED <div style="text-align: center; font-size: 0.8em;">Minimum Documentation Searched ⁷</div> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%; border-bottom: 1px solid black; font-size: 0.8em;">Classification System</th> <th style="border-bottom: 1px solid black; font-size: 0.8em;">Classification Symbols</th> </tr> <tr> <td style="vertical-align: top; padding: 5px;">IPC 4</td> <td style="vertical-align: top; padding: 5px;">A 61 J 1/00, 5/00; B 01 F 1/00, 3/00, /12, 15/00, /02; B 67 C 3/00, /02, /04, /22</td> </tr> <tr> <td style="vertical-align: top; padding: 5px;">US C1</td> <td style="vertical-align: top; padding: 5px;">128: 272.1; 141: 97, 98, 392; 206: 219; 215: 308; 604: 416</td> </tr> </table> <div style="text-align: center; font-size: 0.8em; margin-top: 5px;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸</div> <div style="padding: 10px 5px; font-family: monospace; font-size: 1.1em; margin-top: 10px;">SE, NO, DK, FI classes as above</div>			Classification System	Classification Symbols	IPC 4	A 61 J 1/00, 5/00; B 01 F 1/00, 3/00, /12, 15/00, /02; B 67 C 3/00, /02, /04, /22	US C1	128: 272.1; 141: 97, 98, 392; 206: 219; 215: 308; 604: 416		
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III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹ <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%; border-bottom: 1px solid black; font-size: 0.8em;">Category ¹⁰</th> <th style="width: 60%; border-bottom: 1px solid black; font-size: 0.8em;">Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²</th> <th style="width: 30%; border-bottom: 1px solid black; font-size: 0.8em;">Relevant to Claim No. ¹³</th> </tr> <tr> <td style="vertical-align: top; text-align: center; padding: 10px 5px;">A</td> <td style="vertical-align: top; padding: 10px 5px;">EP, A1, 0 033 374 (AGFA-GEVAERT AKTIENGESELLSCHAFT) 12 August 1981</td> <td style="vertical-align: top; padding: 10px 5px;"></td> </tr> </table>			Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³	A	EP, A1, 0 033 374 (AGFA-GEVAERT AKTIENGESELLSCHAFT) 12 August 1981			
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<div style="display: flex; justify-content: space-between; font-size: 0.8em;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div>										
IV. CERTIFICATION <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black; padding: 5px;">Date of the Actual Completion of the International Search</td> <td style="width: 50%; border-bottom: 1px solid black; padding: 5px;">Date of Mailing of this International Search Report</td> </tr> <tr> <td style="border-bottom: 1px solid black; padding: 5px; text-align: center;">1989-04-20</td> <td style="border-bottom: 1px solid black; padding: 5px; text-align: center;">1989 -04- 2 5</td> </tr> <tr> <td style="border-bottom: 1px solid black; padding: 5px;">International Searching Authority</td> <td style="border-bottom: 1px solid black; padding: 5px;">Signature of Authorized Officer</td> </tr> <tr> <td style="padding: 5px; text-align: center;">Swedish Patent Office</td> <td style="padding: 5px; text-align: center;"> Wiva Asplund </td> </tr> </table>			Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	1989-04-20	1989 -04- 2 5	International Searching Authority	Signature of Authorized Officer	Swedish Patent Office	 Wiva Asplund
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